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A Bibliography of the Northern and Western Corn Rootworm: An Update 1977 through 1988

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Introduction

In 1974 the Illinois Natural History Survey published a bibliography of the northern and western corn rootworm. An update through 1976 was published in 1977. In the twelve years since that publication, the literature on these two insects has grown immensely. This bibliography supplements those earlier publications and covers the period from January 1977 through December 1988. Like its predecessors, this bibliography is generally limited to literature dealing with the northern corn rootworm, *Diabrotica barberi* (referred to as *D. longicornis barberi* before the subspecies was raised to species level in 1983), and the western corn rootworm, *D. virgifera virgifera*. Literature on the Mexican corn rootworm, *D. virgifera zeae*, is now also included since this pest is present in the southwestern part of the United States. The 434 titles in the present list were obtained from standard reference sources (e.g., AGRICOLA, BIOSIS Previews, CAB Abstracts, Dissertation Abstracts International, OCLC, and Science Citation Index) and from the personal files of field crop entomologists in the United States and Canada.

Entries are listed alphabetically by author and then by date of publication. Only materials published in English were selected, including journal articles, books and portions of books, M.S. and Ph.D. theses, agricultural extension publications, manuals, and fact sheets. Only the latest revisions are listed for agricultural extension publications (1989 revisions were included when 1988 versions were out of print). Literature that dealt solely with insecticide evaluations or recommendations and contained no discussion of pest biology was excluded.

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Except for citations preceded by a ♦ symbol, copies were obtained for each document (abstracts in the case of Ph.D. theses). Key words to be included in the subject index were then assigned on the basis of content and are given within parentheses at the end of each entry. Key words taken directly from titles were listed in the index but are not repeated in the parenthetical listings. Citations preceded by a ♦ were assigned key words solely on the basis of their titles. The subject index and a list of periodicals cited appear at the end of this publication.

This bibliography (with periodic updates) will be available on diskette (5.25 or 3.5 inch) in Wordperfect or ASCII text file format for IBM-compatible computers. These diskettes are available at a cost of $5.00 by contacting the senior author at the Natural History Survey.

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Citations

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2. **Agriculture Canada.** 1981. Northern corn rootworm, *Diabrotica longicornis* (Say). Agric. Canada. Insect Identification Sheet 54. 2 pp. (*D. barberi* as *D. longicornis*, biology)

3. **Ahmad, N., D.D. Walgenbach, and G.R. Sutter.** 1979. Comparative disappearance of fonofos, phorate and terbufos soil residues under similar South Dakota field conditions. Bull. Environ. Contam. Toxicol. 23: 423–429. (*Diabrotica* spp., insecticide degradation, insecticide persistence)

4. **Ahmad, N., D.D. Walgenbach, and G.R. Sutter.** 1979. Degradation rates of technical carbofuran and a granular formulation in four soils with known insecticide use history. Bull. Environ. Contam. Toxicol. 23: 572–574. (*Diabrotica* spp., insecticide persistence, insecticide degradation, insecticide history)

5. **Ahmad, N., D.D. Walgenbach, and G.R. Sutter.** 1979. Differential degradation rates of technical and formulated carbofuran in soil. Proc. N. D. Acad. Sci. 33: 75. (*Diabrotica* spp., insecticide degradation, insecticide persistence)

6. **Ahmad, N., D.D. Walgenbach, and G.R. Sutter.** 1979. Some properties of microsomal mixed function oxidase in southern and western corn rootworm larvae (abstract). Proc. N. Cent. Br. Entomol. Soc. Am. 1978, 33: 48. (*D. virgifera virgifera*)

7. **Andersen, J.F.** 1984. The role of attractants and feeding stimulants in the selection of *Cucurbita* flowers by Diabroticite beetles (Coleoptera: Chrysomelidae). Ph.D. Thesis, University of Illinois at Urbana-Champaign. (*D. virgifera virgifera*, plant volatiles, kairomones, semiochemicals, indole, electroantennogram, phenology, sex ratio, cucurbitacins)

8. **Andersen, J.F., and R.L. Metcalf.** 1986. Identification of a volatile attractant for *Diabrotica* and *Acalymma* spp. from blossoms of *Cucurbita maxima* Duchesne. J. Chem. Ecol. 12(3): 687–699. (*D. virgifera virgifera*, plant volatiles, indole, electroantennogram, phenology, sex ratio)

9. **Andersen, J.F., and R.L. Metcalf.** 1987. Factors influencing distribution of *Diabrotica* spp. in blossoms of cultivated *Cucurbita* spp. J. Chem. Ecol. 13(4): 681–699. (*D. virgifera virgifera, D. barberi*, pollen, cucurbitacins, host plant selection, plant volatiles)

10. **Andersen, J.F., R.D. Plattner, and D. Weisleder.** 1988. Metabolic transformations of cucurbitacins by *Diabrotica virgifera virgifera* LeConte and *D. undecimpunctata howardi* Barber. Insect Biochem. 18(1): 71–77. (metabolism, detoxification)

11. **Andersen, J.F., and P.J. Wilkin.** 1986. Methods for the study of pheromones and kairomones. Pages 57–82 *in* J. L. Krysan and T. A. Miller, eds. Methods for the study of pest *Diabrotica*. Springer-Verlag, New York. (*D. barberi, D. virgifera virgifera, D. virgifera zeae*, bioassay, electroantennogram, cucurbitacins, *Cucurbita* spp., plant volatiles, indole)

12. **Andow, D., and R. Wetzler.** 1982. A new method for mass marking insects. Entomologist's Monthly Mag. 118: 211–212. (*D. barberi* as *D. longicornis*, mark and recapture)

13. **Anonymous.** 1987. An alternate school of thought. Crops Soils Mag. 39(8): 25–26. (*D. barberi, D. virgifera virgifera*, extended diapause, environmental factors, temperature, crop rotation)

14. **Apple, J.W., H.C. Chiang, L.M. English, L.K. French, A.J. Keaster, G.F. Krause, Z B Mayo, J.D. Munson, G.J. Musick, J.C. Owens, E.E. Rasmussen, R.E. Sechriest, J.J. Tollefson, and J.L. Wedberg.** 1977. Impact of northern and western corn rootworm larvae on field corn. N. Cent. Reg. Res. Publ. 239. Research Division, University of Wisconsin, Madison. 10 pp. (*D. virgifera virgifera, D. barberi* as *D. longicornis*, yield losses, damage [larval], host plant resistance, economic thresholds, sampling [egg], economics, root damage ratings)

♦15. **Arnold, F.J.** 1981. Residual activity and efficacy of permethrin and fenvalerate for control of corn soil pests. M.S. Thesis, University of Missouri, Columbia. (*Diabrotica* spp., pyrethroids)

16. **Bach, C.E.** 1977. Distribution of *Acalymma vittata* and *Diabrotica virgifera* (Coleoptera: Chrysomelidae) on cucurbits. Great Lakes Entomol. 10(3): 123–125. (*D. virgifera virgifera, Cucurbita* spp., competition)

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18. **Bach, C.E.** 1988. Effects of host plant patch size on herbivore density: underlying mechanisms. Ecology 69(4): 1103–1117. (*D. virgifera virgifera*, Cucurbitaceae, movement [adult], population dynamics)

19. **Ball, H.J.** 1981. Larval and adult control recommendations and insecticide resistance data for corn rootworms in Nebraska (1948–1981). Report 3 (rev.). Agric. Exp. Sta., University of Nebraska, Lincoln. 16 pp. (*D. virgifera virgifera, D. barberi* as *D. longicornis*, insecticide recommendations, insecticide history, pest management)

20. **Ball, H.J.** 1982. Spectral response of the adult western corn rootworm (Coleoptera: Chrysomelidae) to selected wavelengths. J. Econ. Entomol. 75(5): 932–933. (*D. virgifera virgifera*, trap color, traps [adult], vision)

21. **Ball, H.J.** 1983. Aldrin and dieldrin residues in Nebraska soils as related to decreasing LD_{50} values for the adult western corn rootworm—1962–1981. J. Environ. Sci. Health B 18(6): 735–744. (*D. virgifera virgifera*, insecticide residues)

22. **Ball, H.J., and P.P. Su.** 1979. Effect of sublethal dosages of carbofuran and carbaryl on fecundity and longevity of the female western corn rootworm. J. Econ. Entomol. 72(6): 873–876. (*D. virgifera virgifera*, oviposition, insecticides [sublethal dosage])

23. **Ballard, J.B., and Z B Mayo.** 1979. Predatory potential of selected ant species on eggs of western corn rootworm. Environ. Entomol. 8(3): 575–576. (*D. virgifera virgifera*, predation, biological control)

24. **Bartelt, R.J., and H.C. Chiang.** 1977. Field studies involving the sex-attractant pheromones of the western and northern corn rootworm beetles. Environ. Entomol. 6(6): 853–861. (*D. virgifera virgifera, D. barberi* as *D. longicornis*, trap capture, environmental factors, temperature, wind, trap height, mating status, periodicity, pheromone traps)

♦25. **Bereza, K.** 1983. Corn rootworms. Fact sheet. Ontario Ministry of Agriculture and Food. Order no. 83-052 (rev. of 1981 ed.). 3 pp. (*Diabrotica* spp., biology)

♦26. **Bergman, M.K.** 1980. Optimizing sampling for corn rootworm larvae. M.S. Thesis, Iowa State University, Ames. (*D. virgifera virgifera, D. barberi*, sampling [larval])

27. **Bergman, M.K.** 1983. Field studies on the population dynamics and management of corn rootworms. Ph.D. Thesis, Purdue University, West Lafayette, IN. (*D. barberi, D. virgifera virgifera*, economic thresholds, sampling [larval], cultivation time applications, planting date, heat units, phenology, adult emergence)

28. **Bergman, M.** 1987. Corn rootworm control: do we have any new solutions? Pages 41–49 *in* Illinois Agricultural Pesticides Conference '87, Thirty-ninth Spray School, summaries of presentations. Coop. Ext. Serv., University of Illinois at Urbana-Champaign. (*Diabrotica* spp., pest management, cultivation time applications, adult control, dispersal, movement [adult])

29. **Bergman, M.K., J.J. Tollefson, and P.N. Hinz.** 1981. Sampling scheme for estimating populations of corn rootworm larvae. Environ. Entomol. 10(6): 986–990. (*D. virgifera virgifera, D. barberi*, sampling [larval], flotation [larval], soil washing apparatus)

30. **Bergman, M.K., J.J. Tollefson, and P.N. Hinz.** 1983. Spatial dispersion of corn rootworm larvae (Coleoptera: Chrysomelidae) in Iowa cornfields. Environ. Entomol. 12(5): 1443–1446. (*D. virgifera virgifera, D. barberi*, sampling [larval], dispersion [larval])

31. **Bergman, M.K., and F.T. Turpin.** 1982. Cultivator versus planting treatment for rootworms. Pages 39–42 *in* Thirty-fourth Illinois Custom Spray Operators Training School, summaries of presentations. Coop. Ext. Serv., University of Illinois at Urbana-Champaign. (*Diabrotica* spp., cultivation time applications)

32. **Bergman, M.K., and F.T. Turpin.** 1984. Impact of corn planting date on the population dynamics of corn rootworms (Coleoptera: Chrysomelidae). Environ. Entomol. 13(3): 898–901. (*D. virgifera virgifera, D. barberi*)

33. **Bergman, M.K., and F.T. Turpin.** 1986. Phenology of field populations of corn rootworms (Coleoptera: Chrysomelidae) relative to calendar date and heat units. Environ. Entomol. 15(1): 109–112. (*D. virgifera virgifera, D. barberi*)

34. **Bollinger, E.K., and J.W. Caslick.** 1985. Factors influencing blackbird damage to field corn. J. Wildlife Management 49(4): 1109–1115. (*D. barberi* as *D. longicornis, Agelaius phoeniceus*, damage by birds)

35. **Bollinger, E.K., and J.W. Caslick.** 1985. Northern corn rootworm beetle densities near a red-winged blackbird roost. Can. J. Zool. 63(3): 502–505. (*D. barberi* as *D. longicornis, Agelaius phoeniceus*, predation)

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37. **Branson, T.F.** 1978. Optimum temperature for long-term storage of eggs of *Diabrotica virgifera* (Coleoptera: Chrysomelidae). Ent. Exp. Appl. 24(2): 199–200. (*D. virgifera virgifera*, rearing)

38. **Branson, T.F.** 1982. Olfactory response of larvae of *Diabrotica virgifera virgifera* to plant roots. Ent. Exp. Appl. 31(3): 303–307. (movement [larval], host location, olfaction)

39. **Branson, T.F.** 1986. Larval feeding behavior and host-plant resistance in maize. Pages 159–182 *in* J. L. Krysan and T. A. Miller, eds. Methods for the study of pest *Diabrotica*. Springer-Verlag, New York. (*D. barberi, D. virgifera virgifera*, movement [larval], host plant selection, artificial infestation, root damage ratings, lodging, tolerance, antibiosis, antixenosis, host location)

40. **Branson, T.F.** 1987. The contribution of prehatch and posthatch development to protandry in the chrysomelid, *Diabrotica virgifera virgifera*. Ent. Exp. Appl. 43(3): 205–208. (egg hatch duration, sex ratio, adult emergence, rearing)

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42. **Branson, T.F., and P.L. Guss.** 1984. Sterilization of adult male western corn rootworms by gamma radiation in an inert atmosphere. J. Kansas Entomol. Soc. 57(4): 717–719. (*D. virgifera virgifera*, sterile insect release)

43. **Branson, T.F., P.L. Guss, and J.J. Jackson.** 1977. Mating frequency of the western corn rootworm. Ann. Entomol. Soc. Am. 70(4): 506–508. (*D. virgifera virgifera*, reproductive status, oviposition, mating status)

44. **Branson, T.F., P.L. Guss, and J.J. Jackson.** 1978. Sterilizing male western corn rootworms with gamma radiation (Coleoptera: Chrysomelidae). J. Kansas Entomol. Soc. 51(2): 270–273. (*D. virgifera virgifera*, sterile insect release)

45. **Branson, T.F., P.L. Guss, and J.L. Krysan.** 1978. Winter populations of some *Diabrotica* in Central Mexico: voltinism and pheromone response. Ann. Entomol. Soc. Am. 71(2): 165–166. (*D. virgifera virgifera, D. virgifera zeae*, diapause)

46. **Branson, T.F., and J.J. Jackson.** 1988. An improved diet for adult *Diabrotica virgifera virgifera* (Coleoptera: Chrysomelidae). J. Kansas Entomol. Soc. 61(3): 353–355. (rearing, diet [adult])

47. **Branson, T.F., J.J. Jackson, and G.R. Sutter.** 1988. Improved method for rearing *Diabrotica virgifera virgifera* (Coleoptera: Chrysomelidae). J. Econ. Entomol. 81(1): 410–414.

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49. **Branson, T.F., and J. Reyes R.** 1983. The association of *Diabrotica* spp. with *Zea diploperennis*. J. Kansas Entomol. Soc. 56(1): 97–99. (*D. barberi, D. virgifera virgifera, D. virgifera zeae*, host plant resistance)

50. **Branson, T.F., J. Reyes R., and H. Valdés M.** 1982. Field biology of Mexican corn rootworm, *Diabrotica virgifera zeae* (Coleoptera: Chrysomelidae), in central Mexico. Environ. Entomol. 11(5): 1078–1083. (*D. virgifera virgifera*, diapause, soil moisture, population dynamics, predation, pathogens [insect], irrigation, rainfall, environmental factors, egg hatch, developmental time, oviposition, weeds)

51. **Branson, T.F., and G.R. Sutter.** 1985. Influence of population density of immatures on size, longevity, and fecundity of adult *Diabrotica virgifera virgifera* (Coleoptera: Chrysomelidae). Environ. Entomol. 14(6): 687–690. (root damage ratings, oviposition, size [adult])

52. **Branson, T.F., and G. R.Sutter.** 1986. Influence of application date on damage resulting from controlled infestations with eggs of *Diabrotica virgifera virgifera* (Coleoptera: Chrysomelidae). J. Econ. Entomol. 79(3): 838–839. (artificial infestation, egg hatch duration, root damage ratings)

53. **Branson, T.F., G.R. Sutter, and J.R. Fisher.** 1980. Plant response to stress induced by artificial infestations of western corn rootworm. Environ. Entomol. 9(2): 253–257. (*D. virgifera virgifera*, root damage ratings, yield losses, plant stress)

54. **Branson, T.F., G.R. Sutter, and J.R. Fisher.** 1981. The independence of rootworm damage ratings and the size of maize root systems. J. Kansas Entomol. Soc. 54(4): 694–696. (*D. virgifera virgifera*, root size, root damage ratings)

55. **Branson, T.F., G.R. Sutter, and J.R. Fisher.** 1981. Non-diapause eggs of western corn rootworms in artificial field infestations. Environ. Entomol. 10(1): 94–96. (*D. virgifera virgifera*, artificial infestation, non-diapause strain)

56. **Branson, T.F., G.R. Sutter, and J.R. Fisher.** 1982. Comparison of a tolerant and a susceptible maize inbred under artificial infestations of *Diabrotica virgifera virgifera*: yield and adult emergence. Environ. Entomol. 11(2): 371–372. (root damage ratings, tolerance, host plant resistance, yield losses)

57. **Branson, T.F., H. Valdés M., and A.L. Kahler.** 1986. Evaluation of Mexican populations of maize for resistance to larvae of *Diabrotica virgifera* (Coleoptera: Chrysomelidae). Maydica 31(2): 173–177. (*D. virgifera virgifera, D. virgifera zeae*, host plant resistance, root damage ratings)

58. **Branson, T.F., V.A. Welch, G.R. Sutter, and J.R. Fisher.** 1983. Resistance to larvae of *Diabrotica virgifera virgifera* in three experimental maize hybrids. Environ. Entomol. 12(5): 1509–1512. (host plant resistance, root damage ratings, yield losses, antixenosis)

59. **Briggs, S.P.** 1987. Using traps for insect management. Pages 15–19 *in* 1987 Thirteenth Annual Illinois Crop Protection Workshop proceedings. Coop. Ext. Serv., University of Illinois at Urbana-Champaign. (*Diabrotica* spp., traps [adult], emergence traps, cucurbitacin vial traps, pest management)

60. **Briggs, S.P., and J.T. Shaw.** 1983. Monitoring for black cutworms and corn rootworms. Pages 135–138 *in* Thirty-fifth Illinois Custom Spray Operators Training School, summaries of presentations. Coop. Ext. Serv., University of Illinois at Urbana-Champaign. (*D. barberi, D. virgifera virgifera*, cucurbitacin vial traps, root damage ratings, visual counts, population measurement, sampling [adult])

61. **Bruss, R.G.** 1981. Intrafield dispersal of adult corn rootworms. Ph.D. Thesis, Iowa State University, Ames. (*D. barberi, D. virgifera virgifera*, movement [adult], temperature, population density, pheromone)

62. **Burkhardt, C.C., and G.J. Michels, Jr.** 1981. Western corn rootworm: research on distribution, damage and control in Wyoming. Agric. Exp. Sta. Bull. RJ169, University of Wyoming, Laramie. 18 pp. (*D. virgifera virgifera*, biology, distribution [geographical], crop rotation, root damage ratings, economics)

♦63. **Bush, M.R.** 1988. Impact of selected cultural practices on soil invertebrates in continuous corn and a new serological technique for identifying predators of corn rootworms. M.S. Thesis, Purdue University, West Lafayette, IN. (*Diabrotica* spp., predation, biological control)

64. **Buttery, R.G., and L.C. Ling.** 1985. Volatile components of corn roots: possible insect attractants. J. Agric. Food Chem. 33: 772–774. (*D. barberi*, plant volatiles, olfaction, host plant selection)

65. **Call, D.J., D.D. Walgenbach, and G.R. Sutter.** 1977. Corn rootworm cholinesterase activity as influenced by species, sex, age, and cold storage. J. Econ. Entomol. 70(5): 533–535. (*D. virgifera virgifera*, sex differences)

66. **Calvin, D.** 1986. Western and northern corn rootworm management in Pennsylvania. Special Circ. 333. Coop. Ext. Serv., Pennsylvania State University, State College. 8 pp. (*D. barberi, D. virgifera virgifera*, pest management, biology, sampling [adult], economic thresholds, crop rotation)

67. **Calvin, D.D., and F.L. Poston.** 1984. Managing arthropods in corn with an emphasis on biological control. Pages 87–97 *in* Proc. Intl. Symp.: The Role of Biological Control in Pest Management. IOBC/WHRS. November 16–20, 1981. Santiago, Chile. University Press, Ottawa, Canada. (*D. barberi* as *D. longicornis, D. virgifera virgifera*, crop rotation)

♦68. **Cameron, K.** 1982. Effect of ammonia on post-diapause western corn rootworm eggs and larvae. M.S. Thesis, South Dakota State University, Brookings. (*D. virgifera virgifera*, fertilizer)

69. **Capinera, J.L., N.D. Epsky, and D.C. Thompson.** 1986. Effect of adult western corn rootworm (Coleoptera: Chrysomelidae) ear feeding on irrigated field corn in Colorado. J. Econ. Entomol. 79(6): 1609–1612. (*D. virgifera virgifera*, silk feeding, yield losses, irrigation)

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71. **Chapman, R.A., and C.R. Harris.** 1980. Insecticidal activity and persistence of terbufos, terbufos sulfoxide and terbufos sulfone in soil. J. Econ. Entomol. 73(4): 536–543. (*D. barberi* as *D. longicornis*, soil type, soil moisture, temperature, environmental factors, bioassay, toxicity, insecticide persistence, insecticide degradation, phorate, carbofuran, insecticide volatility, insecticide residues)

72. **Chiang, H.C.** 1978. Pest management in corn. Ann. Rev. Entomol. 23: 101–123. (*D. barberi* as *D. longicornis, D. virgifera virgifera*)

73. **Chiang, H.C.** 1982. Factors to be considered in refining a general model of economic threshold. Entomophaga 27 (Special Issue): 99–103. (*D. virgifera virgifera*, plant stress, host plant resistance, phenology)

74. **Chiang, H.C., and L.K. French.** 1980. Host tolerance, a short-term pest management tool—maize and corn rootworm as a model. Plant Prot. Bull., F.A.O. 28(4): 137–138. (*D. virgifera virgifera*, host plant resistance, survival, root damage ratings)

75. **Chiang, H.C., L.K. French, and D.E. Rasmussen.** 1980. Quantitative relationship between western corn rootworm population and corn yield. J. Econ. Entomol. 73(5): 665–666. (*D. virgifera virgifera*, artificial infestation, yield losses, economic thresholds, rainfall, population density)

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77. **Chio, H., C.S. Chang, R.L. Metcalf, and J. Shaw.** 1978. Susceptibility of four species of *Diabrotica* to insecticides. J. Econ. Entomol. 71(3): 389–393. (*D. barberi* as *D. longicornis, D. virgifera virgifera*, insecticide resistance, bioassay, aldrin, heptachlor, DDT, fensulfothion, fonofos, malathion, diazinon, methoxychlor, carbaryl, carbofuran, chlorpyrifos, phorate, terbufos, permethrin)

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♦144. **Godfrey, L.D.** 1980. Population dynamics of western corn rootworm beetles in first-year and continuous corn. M.S. Thesis, Purdue University, West Lafayette, IN. (*D. virgifera virgifera*, first-year cornfields, continuous cornfields)

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149. **Gorder, G.W., J.J. Tollefson, and P.A. Dahm.** 1980. Carbofuran residue analysis and control of corn rootworm larval damage. Iowa State J. Res. 55(1): 25–33. (*D. barberi* as *D. longicornis, D. virgifera virgifera*, root damage ratings, insecticide history, insecticide residues, insecticide degradation, insecticide persistence)

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♦156. **Grogan, J.E.** 1979. Impact of rootworm larval damage on yield and quality of corn grain. M.S. Thesis, Purdue University, West Lafayette, IN. (*Diabrotica* spp., yield losses)

157. **Guse, C.A.** 1985. The effects of weather on visual counts and cucurbitacin trap catches of adult western corn rootworms, *Diabrotica virgifera*. M.S. Thesis, University of Illinois at Urbana-Champaign. (*D. virgifera virgifera*, environmental factors, cucurbitacin vial traps, temperature, rainfall)

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172. **Harris, C.R., and S.A. Turnbull.** 1977. Laboratory assessment of the potential of 16 experimental compounds as soil insecticides. Can. Entomol. 109(8): 1109–1114. (*D. barberi* as *D. longicornis*, bioassay, chlorpyrifos, carbofuran, dieldrin, soil type, soil moisture, temperature, insecticide volatility, insecticide persistence, terbufos)

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♦174. **Harvey, J.P.** 1978. Biosystematics and hybridization in five species of diabroticites. M.S. Thesis, University of Illinois at Urbana-Champaign. (*Diabrotica* spp., taxonomy)

♦175. **Hass, M.J.** 1987. Soil degradation comparisons of corn rootworm insecticides in the field and laboratory. M.S. Thesis, South Dakota State University, Brookings. (*Diabrotica* spp., insecticide degradation)

♦176. **Hedrick, T.W.** 1978. First year corn damage—northern corn rootworm ovipositional studies. M.S. Thesis, South Dakota State University, Brookings. (*D. barberi*, first-year cornfields)

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♦178. **Hein, G.L.** 1981. Comparison of adult corn rootworm sampling techniques as population estimators and as predictors of subsequent larval damage. M.S. Thesis, Iowa State University, Ames. (*Diabrotica* spp., sampling [adult], population measurement, prediction of damage)

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266–271. (*D. barberi, D. virgifera virgifera*, sampling [adult], traps [adult], sex ratio, population measurement)

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184. **Hein, G.L., and J.J. Tollefson.** 1985. Use of the Pherocon AM trap as a scouting tool for predicting damage by corn rootworm (Coleoptera: Chrysomelidae) larvae. J. Econ. Entomol. 78(1): 200–203. (*D. barberi, D. virgifera virgifera*, sampling [adult], root damage ratings, traps [adult], prediction of damage)

185. **Hein, G.L., and J.J. Tollefson.** 1987. Model of the biotic potential of western corn rootworm (Coleoptera: Chrysomelidae) adult populations, and its use in studying population dynamics. Environ. Entomol. 16(2): 446–452. (*D. virgifera virgifera*, adult emergence, sampling [adult], sampling [egg], mortality, dispersal, movement [adult])

186. **Hein, G.L., J.J. Tollefson, and R.E. Foster.** 1988. Adult northern and western corn rootworm (Coleoptera: Chrysomelidae) population dynamics and oviposition. J. Kansas Entomol. Soc. 61(2): 214–223. (*D. barberi, D. virgifera virgifera*, adult emergence, sampling [adult], sampling [egg], sex ratio, survival, mortality, population density, weather, movement [adult], dispersal)

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♦189. **Henn, R.A.** 1981. Western corn rootworm larvae and lesion nematodes on corn roots. M.S. Thesis, Iowa State University, Ames. (*D. virgifera virgifera*)

190. **Hibbard, B.E., and L.B. Bjostad.** 1988. Behavioral responses of western corn rootworm larvae to volatile semiochemicals from corn seedlings. J. Chem. Ecol. 14(6): 1523–1539. (*D. virgifera virgifera*, plant volatiles, carbon dioxide, kairomones, attractants)

191. **Higgins, R.A., H.L. Brooks, and P.E. Sloderbeck.** 1989. Insect management for corn in 1989. Publ. MF-810 (rev., Entomology 126). Coop. Ext. Serv., Kansas State University, Manhattan. 16 pp. (*D. barberi, D. virgifera virgifera*, crop rotation, pest management, insecticide recommendations, sampling [adult], adult control)

192. **Higgins, R.A., T.J. Gibb, and G.E. Wilde.** 1988. Corn rootworm management in Kansas field corn. Publ. MF-845 (rev., Entomology 128). Coop. Ext. Serv., Kansas State University, Manhattan. 4 pp. (*D. barberi, D. virgifera virgifera*, pest management, biology, sampling [adult], adult control)

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195. **Homan, H.W., C.R. Baird, G.W. Bishop, J. Blackmer, and D.G. Bolz.** 1984. The western corn rootworm. Current information series 533 (rev.). Coop. Ext. Serv., University of Idaho, Moscow. Unpaged pamphlet. (*D. virgifera virgifera*, biology, pest management, adult control, insecticide recommendations)

♦196. **Hooten, R.S.** 1979. Egg hatching patterns for individual western corn rootworm females. M.S. Thesis, South Dakota State University, Brookings. (*D. virgifera virgifera*, egg hatch)

♦197. **Huckla, D.L.** 1981. The integrated corn pest management program in Missouri: implementation, pest problems, pesticide usage, and grower acceptance. M.S. Thesis, University of Missouri, Columbia. (*Diabrotica* spp.)

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200. **Jackson, J.J.** 1985. *Diabrotica* spp. Pages 237–254 *in* P. Singh and R. F. Moore, eds. Handbook of insect rearing. Vol. 1. Elsevier Science Publ., Amsterdam. (*D. virgifera virgifera*, diet [adult], pathogens [insect])

201. **Jackson, J.J.** 1985. Parasitism of the western corn rootworm with the nematode, *Steinernema feltiae*. Ph.D. Thesis, University of Minnesota, St. Paul. (*D. virgifera virgifera*, parasites, temperature, soil moisture, environmental factors, biological control)

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203. **Jackson, J.J., and D.G. Davis.** 1978. Rearing western corn rootworm larvae on seedling corn (Coleoptera: Chrysomelidae). J. Kansas Entomol. Soc. 51(3): 353–355. (*D. virgifera virgifera*)

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♦214. **Karr, L.L.** 1984. Temporal efficiency of the Pherocon AM trap for adult corn rootworm sampling. M.S. Thesis, Iowa State University, Ames. (*Diabrotica* spp., sampling [adult], traps [adult], periodicity)

♦215. **Karr, L.L., and J.R. Coats.** 1985. Insecticidal activity of dextro-limonene, a monoterpenoid isolated from ethereal oils of citrus (abstract). 190th Am. Chemical Soc. National Meeting, Chicago. September 8–13, 1985.

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226. **Krysan, J.L.** 1978. Egg dormancy in *Diabrotica*: embryological, geographical and taxonomic aspects (abstract). Proc. N. Cent. Br. Entomol. Soc. Am. 1978, publ. 1979, 33: 60. (*D. virgifera virgifera*, diapause, genetics, taxonomy, embryonic development, distribution [geographical])

227. **Krysan, J.L.** 1982. Diapause in the Nearctic species of the *virgifera* group of *Diabrotica*: evidence for tropical origin and temperature adaptations. Ann. Entomol. Soc. Am. 75(2): 136–142. (*D. barberi*, *D. virgifera virgifera*, *D. virgifera zeae*, voltinism, evolution)

228. **Krysan, J.L.** 1986. Introduction: biology, distribution, and identification of pest *Diabrotica*. Pages 1–23 *in* J. L. Krysan and T. A. Miller, eds. Methods for the study of pest *Diabrotica*. Springer-Verlag, New York. (*D. barberi*, *D. virgifera virgifera*,

D. virgifera zeae, distribution [geographical], taxonomy, identification [egg], identification [larval], identification [adult], sex determination, sex differences)

229. **Krysan, J.L.** 1987. A phenocline in the sculpturing of the egg chorion in the *virgifera* species group of *Diabrotica* (Coleoptera: Chrysomelidae). Coleopterists Bull. 41(4): 323–326. (*D. barberi, D. virgifera virgifera*, taxonomy)

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236. **Krysan, J.L., J.J. Jackson, and A.C. Lew.** 1984. Field termination of egg diapause in *Diabrotica* with new evidence of extended diapause in *D. barberi* (Coleoptera: Chrysomelidae). Environ. Entomol. 13(5): 1237–1240. (*D. virgifera virgifera*, egg hatch duration, crop rotation, egg hatch)

237. **Krysan, J.L., and T.A. Miller, eds.** 1986. Methods for the study of pest *Diabrotica*. Springer-Verlag, New York. (*D. barberi, D. virgifera virgifera, D. virgifera zeae*, biology, distribution [geographical], taxonomy, rearing, pheromone, kairomones, sampling [egg], sampling [larval], sampling [adult], artificial infestation, host plant resistance, insecticide evaluation, bioassay, vector [disease])

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251. **Ladd, T.L., B.R. Stinner, and H.R. Krueger.** 1983. Find new attractant for corn rootworm. Ohio Report 68(5): 67–69. (*D. barberi*, *D. virgifera virgifera*, eugenol, traps [adult], semiochemicals, movement [adult], dispersal)

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253. **Lampman, R.L.** 1986. Chemical ecology of defense compounds in *Anasa* species (Heteroptera: Coreidae) and volatile attractants for *Diabrotica* species (Coleoptera: Chrysomelidae) Ph.D. Thesis, University of Illinois at Urbana-Champaign. (*D. barberi*, *D. virgifera virgifera*, estragole, indole, eugenol, isoeugenol, phenology, sex ratio, semiochemicals, kairomones, plant volatiles)

254. **Lampman, R.L., and R.L. Metcalf.** 1987. Multicomponent kairomonal lures for southern and western corn rootworms (Coleoptera: Chrysomelidae: *Diabrotica* spp.). J. Econ. Entomol. 80(6): 1137–1142. (*D. virgifera virgifera*, kairomones, attractants, semiochemicals, traps [adult], indole, eugenol)

255. **Lampman, R.L., and R.L. Metcalf.** 1988. The comparative response of *Diabrotica* species (Coleoptera: Chrysomelidae) to volatile attractants. Environ. Entomol. 17(4): 644–648. (*D. barberi*, *D. virgifera virgifera*, host plant selection, traps [adult], semiochemicals, kairomones, estragole, eugenol, indole, isoeugenol, plant volatiles)

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259. **Lance, D.R., and J.R. Fisher.** 1987. Food quality of various plant tissues for adults of the northern corn rootworm (Coleoptera: Chrysomelidae). J. Kansas Entomol. Soc. 60(3): 462–466. (*D. barberi*, oviposition, longevity, fecundity, rearing)

♦260. **Lawson, E.C.** 1986. Influence of tillage and depth in the soil on soil temperature and survival of overwintering western corn rootworm eggs. M.S. Thesis, Iowa State University, Ames. (*D. virgifera virgifera*)

261. **Lazarus, W.F.** 1981. Optimal management of a common property pest under risk: an application to the corn rootworm. Ph.D. Thesis, University of Illinois at Urbana-Champaign. (*D. barberi* as *D. longicornis*, *D. virgifera virgifera*, risk management, economics, economic thresholds, model, crop rotation, crop insurance, sampling [adult], insecticide resistance, movement [adult], genetics, soybeans)

262. **Lazarus, W.F., and B.L. Dixon.** 1984. Agricultural pests as common property: control of the corn rootworm. Am. J. Agric. Econ. 66(4): 456–465. (*D. barberi* as *D. longicornis*, *D. virgifera virgifera*, insecticide resistance, crop rotation, soybeans, economics)

263. **Lazarus, W.F., and E.R. Swanson.** 1983. Insecticide use and crop rotation under risk: rootworm control in corn. Am. J. Agric. Econ. 65(4): 738–747. (*D. barberi* as *D. longicornis*, *D. virgifera virgifera*, economic thresholds, crop insurance, soybeans, economics, risk management)

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269. **Lew, A.C.** 1979. Pheromone secretory cells and the behavioral aspect of mating in the western corn rootworm, *Diabrotica virgifera* LeConte. Ph.D. Thesis, University of Nebraska, Lincoln. (*D. virgifera virgifera*, spermatophore, reproductive behavior)

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♦320. **Newton, J.P.** 1978. Microbial degradation of carbofuran in a Nebraska corn field. M.S. Thesis, University of Nebraska, Lincoln. (*Diabrotica* spp., insecticide degradation, biodegradation [enhanced])

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